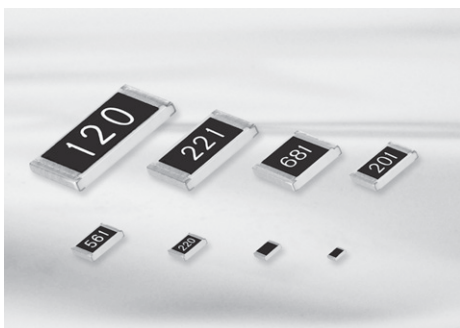


# Automotive Anti-sulfur



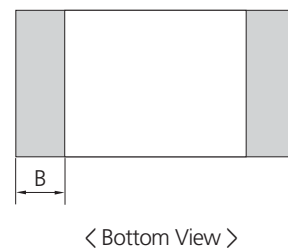
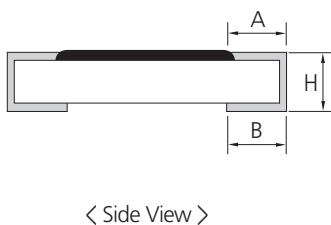
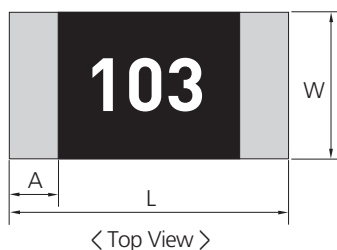
## Feature

- AEC-Q200 Qualified.
- ASTM B809-95 satisfied.
- Excellent anti-sulfur performance.
- Lead-free terminal (matt tin)
- RoHS compliant with exemption.

## Application

- Electronic Control Units of Automotive Parts
- Automotive grade applications
- Infotainment applications for car.

## Structure and Dimensions



(UNIT: mm)

Type	SIZE(Inch)	L	W	H	A	B
RCM0603	0201	0.60 ±0.03	0.30 ±0.03	0.23 ±0.03	0.10 ±0.05	0.15 ±0.05
RCM1005	0402	1.00 ±0.05	0.50 ±0.05	0.35 ±0.05	0.20 ±0.10	0.25 ±0.10
RCM1608	0603	1.60 ±0.10	0.80 ±0.10	0.45 ±0.10	0.30 ±0.20	0.30 ±0.10
RCM2012	0805	2.00 ±0.15	1.25 ±0.15	0.50 ±0.10	0.40 ±0.20	0.35 ±0.20
RCM3216	1206	3.20 ±0.15	1.60 ±0.15	0.55 ±0.10	0.45 ±0.20	0.40 ±0.20
RCM3225	1210	3.20 ±0.20	2.55 ±0.20	0.55 ±0.10	0.45 ±0.20	0.40 ±0.20
RCM5025	2010	5.00 ±0.20	2.50 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60 ±0.20
RCM6432	2512	6.30 ±0.20	3.20 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60 ±0.20

- ※ 0402 and smaller size don't have marking on top of the chips.
- ※ 0603 4-digit models(E-96 series) don't have making on top of the chips.

## Parts Numbering System

- The part number system shall be in the following format

RCM	2 0 1 2 Dimension & Size Code	J Tolerance	1 0 0 Resistance Value	CS Packaging Code
RCM : Automotive Chip Resistor	0603: 0.6×0.3(mm) - 0201(inch) 1005: 1.0×0.5(mm) - 0402(inch) 1608: 1.6×0.8(mm) - 0603(inch) 2012: 2.0×1.2(mm) - 0805(inch) 3216: 3.2×1.6(mm) - 1206(inch) 3225: 3.2×2.5(mm) - 1210(inch) 5025: 5.0×2.5(mm) - 2010(inch) 6432: 6.4×3.2(mm) - 2512(inch)	F : ±1% G : ±2% J : ±5% ※ Jumper : J	3 or 4 digits coding system (EIA coding system) 3digits (E-24 series) 4digits (E-96 series) ※ Jumper : '000'	CS: Tape Packaging 7" ES: Tape Packaging 10" AS: Tape Packaging 13"

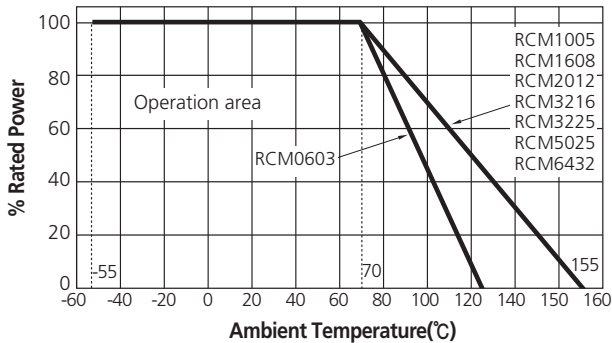
## Specification

Type	Size (inch)	Rated Power (W)	Rated Voltage (V)	Max Working Voltage (V)	Tolerance (%)	Resistance Range (Ω)	T.C.R (ppm/°C)	Working Temp. (°C)	Rated Ambient Temp. (°C)	Moisture Level
RCM0603	0201	1/20	$\sqrt{P \times R}$ P: Rated Power(W) R: Resistance(Ω)	25	±1(F) ±2(G) ±5(J)	1 ~ 9.9 10 ~ 10M	±300 ±250	-55~125	70	Level 1
RCM1005	0402	1/16		50	±0.5(D) ±1(F) ±2(G) ±5(J)	1 ~ 9.9 10 ~ 10M	±300 ±100	-55~155		
RCM1608	0603	1/10		50						
RCM2012	0805	1/8		150						
RCM3216	1206	1/4		200						
RCM3225	1210	1/3		200						
RCM5025	2010	2/3		200						
RCM6432	2512	1		200						

• Please contact our sales representatives or engineers for other specifications

## Power Derating Curve

The rated power is the maximum continuous loading power at 70°C ambient temperature.  
For ambient temperature above 70°C, the loading power follows the below power derating curve.



## Marking

• 3 digits indication (E-24 series)	• 4 digits indication (E-96 series)
<ul style="list-style-type: none"> <li>- Left 2 digits represent significant figures.</li> <li>- Last 1 digit represents exponential number of 10.</li> <li>- Example: <b>103</b> Left 2 digits: <b>10</b> Last 1 digit: <b>3</b> <math>103 = 10 \times 10^3 \Omega</math> <math>= 10000 \Omega = 10k\Omega</math></li> </ul>	<ul style="list-style-type: none"> <li>- Left 3 digits represent significant figures.</li> <li>- Last 1 digit represents exponential number of 10.</li> <li>- Example: <b>1002</b> Left 3 digits: <b>100</b> Last 1 digit: <b>2</b> <math>1002 = 100 \times 10^2 \Omega</math> <math>= 10000 \Omega = 10k\Omega</math></li> </ul>
No marking types for 3 -digit models : RC0402, RC0603, RC1005	No marking types for 4 -digit models : RC0402, RC0603, RC1005, RC1608

## Jumper Rating

Type	Size (inch)	Rated Current (A)	Resistance (A)
RCM0603	0201	0.5	0.05 Max
RCM1005	0402	1.0	
RCM1608	0603	2.0	
RCM2012	0805	2.0	
RCM3216	1206	2.0	
RCM3225	1210	2.0	
RCM5025	2010	2.0	
RCM6432	2512	2.0	

## IEC Code System (E-96, E-24)

E-96	E-24	E-96	E-24	E-96	E-24	E-96	E-24
100	10	178		316		562	56
102		182	18	324	33	576	
105		187		332		590	
107		191		340		604	
110	11	196		348		619	
113		200	20	357	36	634	62
115		205		365		649	
118		210		374		665	
121	12	215		383	39	681	68
124		221	22	392		698	
127		226		402		715	
130	13	232		412		732	
133		237		422		750	75
137		243	24	432	43	768	
140		249		442		787	
143		255		453		806	
147		261		464		825	82
150	15	267		475	47	845	
154		274	27	487		866	
158		280		499		887	
162	16	287		511	51	909	
165		294		523		931	91
169		301	30	536		953	
174		309		549		976	

The specifications and designs contained herein may be subject to change without notice.  
Please contact our sales representatives or product engineers before order.

Operation Notes

Example of land Pattern Design

Recommended Soldering Conditions

General Structure

General

Low ohms (RUT Series)

Ultra Low ohms (RU Series)

Ultra Low Ohms (RUK Series)

Ultra Low Ohms (RJ Series)

Arrays (CONVEX Type)

Arrays (CONCAVE Type)

Arrays (FLAT Type)

Anti-Sulfur Resistors

Anti-Sulfur Resistor Arrays(Convex Type)

Anti-Sulfur Resistor Arrays(Concave Type)

Anti-Sulfur Resistor Arrays (Flat Type)

Automotive Anti-sulfur

Automotive Anti-sulfur Arrays (Convex Type)

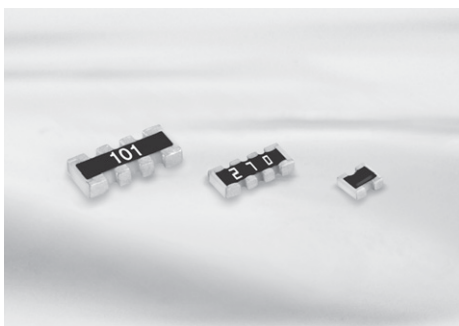
Attenuator

Characteristics Performance

Packaging

Standard Resistance Value

# Automotive Anti-sulfur Arrays (Convex Type)



## Feature

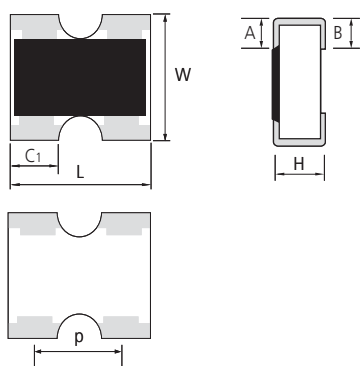
- AEC-Q200 Qualified.
- ASTM B809-95 satisfied.
- Excellent anti-sulfur performance.
- Lead-free terminal (matt tin)
- RoHS complaint with exemption.

## Application

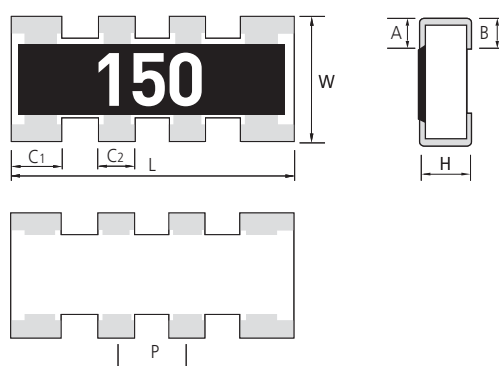
- Electronic Control Units of Automotive Parts
- Automotive grade applications
- Infotainment applications for car.

## Structure and Dimensions

• 2 Array



• 4 Array



(UNIT: mm)

Type	L	W	H	A	B	C1	C2	P
RPM102P	1.00±0.10	1.00±0.10	0.35±0.10	0.25±0.10	0.25±0.10	0.33±0.10	-	0.65±0.10
RPM104P	2.00±0.10	1.00±0.10	0.35±0.10	0.25±0.10	0.25±0.10	0.40±0.10	0.30±0.10	0.50±0.10
RPM164P	3.20±0.10	1.60±0.10	0.50±0.10	0.30±0.15	0.30±0.15	0.60±0.15	0.40±0.15	0.80±0.15

## Parts Numbering System

• The part number system shall be in the following format

RPM	10	4P	J	100	CS
Code Designation	Dimension	Resistors	Tolerance	Resistance Value	Packaging Code
RPM : Automotive Anti-sulfur Array (Convex Type)	10 : 0402 Array 16 : 0603 Array	2P: 2 Pieces 4P: 4 Pieces	F: ±1% G: ±2% J: ±5% ※ Jumper : J	3 or 4 digits coding system (EIA coding system) 3digits (E-24 series) 4digits (E-96 series) ※ Jumper : '000'	CS : Tape Packaging 7" ES : Tape Packaging 10" AS : Tape Packaging 13"

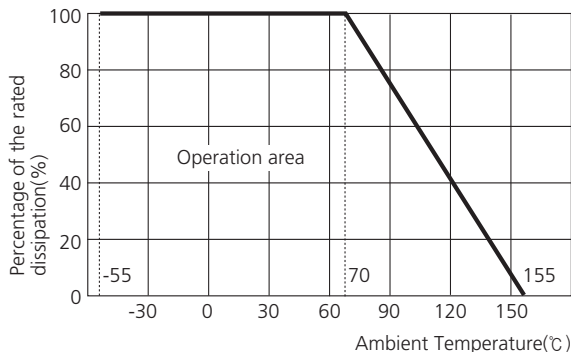
## Specification

Type	Size (inch)	Rated Power (W)	Rated Voltage (V)	Max Working Voltage (V)	Tolerance (%)	Resistance Range (Ω)	T.C.R (ppm/°C)	Working Temp. (°C)	Rated Ambient Temp. (°C)	Moisture Level
RPM 102P	0404	1/16	$\sqrt{P \times R}$ P: Rated Power(W) R: Resistance(Ω)	50	±1(F)	1 ~ 9.9 10 ~ 1M	±300 ±200	-55~155	70	Level 1
RPM 104P	0804	1/16		50	±2(G)					
RPM 164P	1206	1/16		100	±5(J)					

• Please contact our sales representatives or engineers for other specifications

## Power Derating Curve

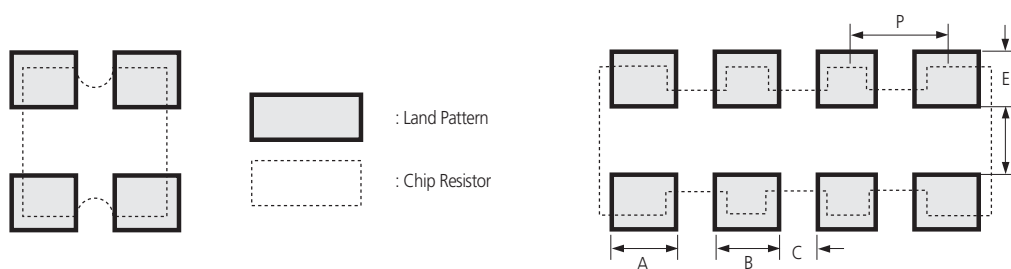
The rated power is the maximum continuous loading power at 70°C ambient temperature.  
For ambient temperature above 70°C, the loading power follows the below power derating curve.



## Jumper Rating

Type	Size (inch)	Rated Current (A)	Resistance (Ω)
RPM102P	0404	1.0	0.05 Max
RPM104P	0804		
RPM164P	1206		

## Land Pattern



Type	A	B	C	D	E	P1	P2
102P	0.4	0.4	0.25	0.5	0.5	0.65	-
104P	0.7	0.3	0.2	0.5	0.5	0.55	0.5
164P	0.7	0.5	0.3	0.9	0.8	0.9	0.8

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Operation Notes

Example of land Pattern Design

Recommended Soldering Conditions

General Structure

General

Low ohms (RUT Series)

Ultra Low ohms (RU Series)

Ultra Low Ohms (RUK Series)

Ultra Low Ohms (RJ Series)

Arrays (CONVEX Type)

Arrays (CONCAVE Type)

Arrays (FLAT Type)

Anti-Sulfur Resistors

Anti-Sulfur Resistor Arrays(Convex Type)

Anti-Sulfur Resistor Arrays(Concave Type)

Anti-Sulfur Resistor Arrays (Flat Type)

Automotive Anti-sulfur

Automotive Anti-sulfur Arrays (Convex Type)

Attenuator

Characteristics Performance

Packaging

Standard Resistance Value

# Thick Film Automotive Chip Resistors

- 1005(0402), 1608(0603), 2012(0805), 3216(1206),



## ■ Features

- AEC-Q200 qualified
- Lead free terminal with matt Tin
- RoHS Compliant.

## ■ Part Number System

RCA	
Type (Series)	
RCA	Thick Film Automotive chip resistor

0603	
Size : mm (inch)	
1005	1.0×0.5mm (0402)
1608	1.6×0.8mm (0603)
2012	2.0×1.2mm (0805)
3216	3.2×1.6mm (1206)

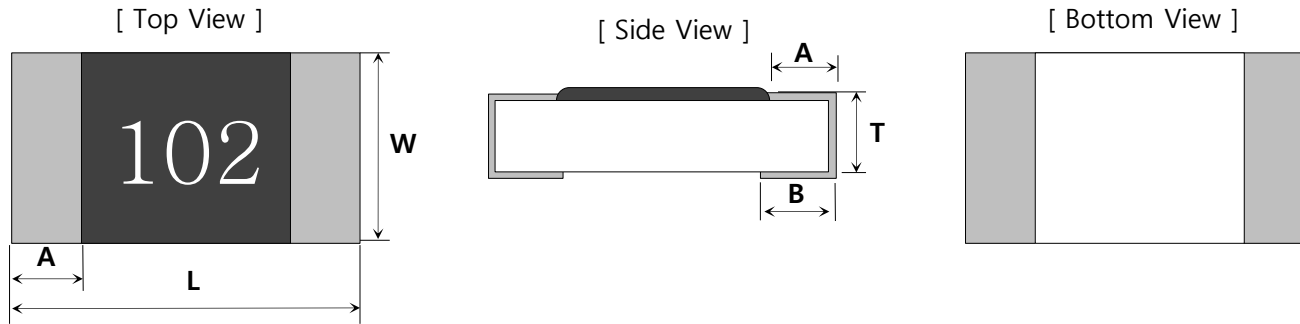
F	
Tolerance	
F	±1.0%
J	±5.0%

\* Jumper : 'J'

2552	
Resistance Value	
- 3-digit code System (E-24 series)	
- 4-digit code System (E-96 series)	
- Jumper : '000'	
- 2552 : 25.5KΩ	

CS	
Packing Type	
CS	7" reel
ES	10" reel
AS	13" reel

## ■ Structure and Dimensions



[ Unit : mm ]

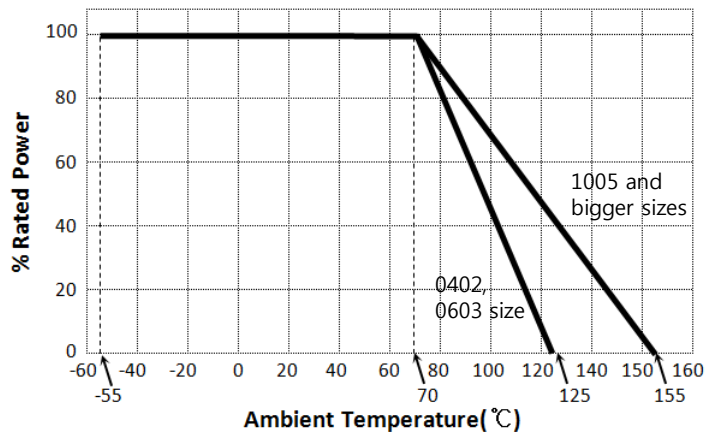
Size(mil)	L	W	T	A	B	Unit Weight
RCA1005(0402)	1.00±0.05	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	0.6mg
RCA1608(0603)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.10	2.1mg
RCA2012(0805)	2.00±0.15	1.25±0.15	0.50±0.10	0.40±0.20	0.35±0.20	4.9mg
RCA3216(1206)	3.10±0.15	1.60±0.15	0.55±0.10	0.45±0.20	0.40±0.20	9.5mg

## Applications and Ratings

Type	Size (mil)	Rated Power [W]	Rated Voltage [V]	Max Working Voltage [V]	Tolerance [%]	Resistance Range [Ω]	T.C.R [ppm/°C]	Working Temp. [°C]	Moisture Level
RCA1005	0402	1/16	$\sqrt{P \times R}$ P : Rated Power(W) R : Resistance(Ω)	50	±1(F) ±5(J)	1 ~ 10M	1~99Ω : ±300 100~10MΩ : ±100	-55 ~ 155	Level 1
RCA1608	0603	1/10		50					
RCA2012	0805	1/8		150					
RCA3216	1206	1/4		200					

• Please contact our sales representatives or engineers for other specifications

## Power Derating Curve



## Jumper Ratings

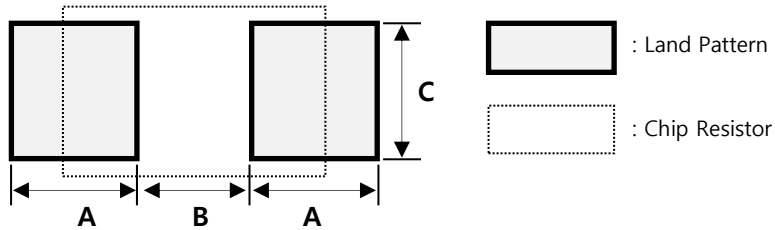
Type	Rated Current [A]	Max Overload Current [A]	Resistance [Ω]	Working Temp.[°C]
1005, 1608	1	2	0.05max	-55 ~ 155
2012 and bigger sizes	2	4		

## Rated Voltage

$$V = \sqrt{P \times R}$$

E : Rated Voltage (V)  
 P : Rated Power (W)  
 R : Resistance Value (Ω)

## ■ Standard Soldering Pad Dimensions



[ Unit : mm ]

Size(mil)	Reflow Soldering			
	A	B	2A + B	C
RCA1005(0402)	0.60	0.50	1.70	0.50
RCA1608(0603)	0.80	0.80	2.40	0.80
RCA2012(0805)	0.90	1.40	3.20	1.20
RCA3216(1206)	1.30	1.80	4.40	1.50



## ■ Performance Characteristics

Test Item	AEC-Q200 Test No.	Test Standard	Test Condition	Requirements	
				Resistor	Jumper
High Temp. Exposure	3	MIL-STD-202 Method 108	Unpowered 125°C 1000hr	$\pm(1\%+0.1\Omega)$	< 50m $\Omega$
Temperature Cycling	4	JESD22 Method JA-104	1000 cycle, -55~125°C 30min dwell time, 1min transition time	$\pm(1\%+0.1\Omega)$	< 50m $\Omega$
Biased Humidity	7	MIL-STD-202 Method 103	10% of rated power 85°C/85%RH, 1000hr	$\pm(3\%+0.1\Omega)$	< 100m $\Omega$
Operational Life	8	MIL-STD-202 Method 108	Rated Power 125°C, 1000hrs 1.5hr ON, 0.5hr OFF	$\pm(3\%+0.1\Omega)$	< 100m $\Omega$
Resistance to Soldering Heat	15	MIL-STD-202 Method 210	Reflow soldering 260 $\pm$ 5°C, 10 sec max.	$\pm(1\%+0.1\Omega)$	< 50m $\Omega$
ESD	17	AEC-Q200-002 ISO/DIS 10605	150pF,2k $\Omega$ ,DC 0.5~8kV & AD 12~25kV	$\pm(3\%+0.1\Omega)$	< 50m $\Omega$
Solderability	18	J-STD-002	Method B, Dry heat @235°C 5sec Method B, Steam aging 8hrs, @215°C, 5sec Method D, Steam aging 8hrs, @260°C, 30sec	$\geq 95\%$ covered	$\geq 95\%$ covered
Board Flex	21	AEC-Q200-005	Deflection point=2mm, 1mm/sec, 60sec	$\pm(1\%+0.1\Omega)$	< 50m $\Omega$
Short Time Overload		JIS C 5201-1 4.13 IEC 60115-1 4.13	2.5 times of rated voltage or maximum overload voltage for 5 sec.	$\pm(1\%+0.1\Omega)$	< 50m $\Omega$

※ NOTICE :All specifications are subject to change without previous notice. Please contact with product representatives or engineers to check specifications.

 Product specifications included in the specifications are effective as of May 01, 2015.

Please be advised that they are standard product specifications for reference only.

We may change, modify or discontinue the product specifications without notice at any time.

So, you need to approve the product specifications before placing an order.

Should you have any question regarding the product specifications,

please contact our sales personnel or application engineers.

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